

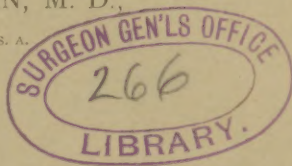
McClellan (Ely)

COMMON CARRIERS
AS THE
PORTERS OF DISEASE.

PART I.

By ELY McCLELLAN, M. D.,

ASSISTANT SURGEON U. S. A.



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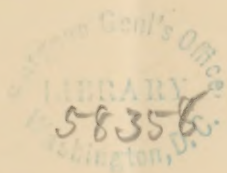
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The abrupt and startling development of contagions in a community reposing in fancied security from the natural causes of disease is inevitably followed by explanatory theories, many of which are as satisfactory as the ancient verdict of coroners' juries, "died from the visitation of God." One class of scientists are able to draw conclusions only from their individual observations of the local manifestation of a disease, and they discard from consideration all other records; others advance facts which bear evidence of incompleteness and of being forced in support of the especial theory; while a last class of observers, those who may be considered as cosmopolitan, learn early that their personal experience is but as an atom, small and incomplete, insignificant of itself, but combined with its fellows capable of resisting perverted natural forces when they menace humanity.

The cholera epidemic of 1873, as it affected the valleys of the Mississippi and Ohio, most strikingly illustrates these statements. At the majority of localities which were infected the origin of the disease was without difficulty and without doubt determined. At others, the initial case being obscure, the "endemic" or "*de novo*" theories were advanced, and the

country was alarmed by the announcement "that at any time, certain conditions being fulfilled, any portion of the United States is liable to the spontaneous generation of this dread disease; that Asiatic cholera is a misnomer; that the proper appellation of the disease is American cholera." In support of this theory the fatal cases of sporadic cholera, which are liable to occur in any community during the heat of summer, are advanced.

The introduction of cholera into certain communities upon the great lines of travel was denied, because the actual contact of the initial cases at such points could not with positiveness be shown. The fact that common carriers may be the insensible porters of disease was overlooked; and although other communities upon the same line of travel were able to demonstrate the importation of the disease, these points could not have been infected in the same way, but were especially selected by some mysterious agency for an endemic demonstration.

The discussion which waged with considerable rancor on all sides was aptly closed by a paper entitled "The Logical Proof of the Contagiousness or Non-contagiousness of Disease," in which paper the learned and illustrious Bellevue professor announces the rather startling proposition "*that cholera, though not a contagious disease, is still a portable disease.*" The dogma is adapted, as an advance from the champion of the non-conformists, to those who may be considered orthodox upon this all-important subject.

The portability of cholera having been established, that of other diseases must be allowed; and it is well to consider carefully the various means by which diseases may be transported, especially as during the present month there have been announced in various sections of the country isolated but fatal cases of disease which were pronounced to be cholera. During an extended journey through the southern and western states ample opportunity for investigation was

afforded the writer, whose thoughts have shaped themselves under the heading which has been adopted for this paper.

What is a common carrier?

From a careful reading of Angell we would answer, common carriers are those who transport persons or goods, by either land or water, for hire. Conspicuously at the head of all carriers stand "railway companies." In this paper we have attempted to show in what way they may become the porters of disease, and at the same time to suggest the remedy.

The age demands rapid transit. A traveler anxious to arrive at his distant home avails himself of the one of the many competing lines of railway that offers the greatest annihilation of space. So urgent is this demand that the journey which in the olden time consumed months at the present is but a matter of days, or even hours, and but from fifteen to eighteen days are required to transport a traveler from European ports upon the Atlantic to American ports upon the Pacific Ocean. A map of the United States is almost grid-ironed, and the community is primitive indeed that is not served by actual contact with or by close proximity to a railway in active operation.

A passenger-train upon any of these roads consists of a baggage-car, one or more coaches for the general traveling public, and generally a Pullman sleeping- or parlor-car for the more exclusive, in addition to the engine furnishing the motive power. A railroad train thus constituted becomes an active agent for the transportation of any contagious disease. The plush or rep-cloth coverings of the seats offer an asylum in its meshes to contagion, while the misnamed *salons* at the end of each car afford unequaled facilities for the distribution and transportation of disease.

Especial attention is asked to the interior of the *salons*. They will be found fitted with a urinal, which, connecting with a tube, allows the urine therein deposited to fall upon

the ground below the car; a commode with a hinged cover, containing a funnel-shaped vessel, which empties all dejections therein deposited upon the ground below the car; a large reservoir with movable cover, which contains the drinking-water furnished for the occupants of the car. This in the majority of coaches completes the furniture of the *salon*; but upon some few roads a small wire-gauze-covered box containing chloride of lime is added.

Upon well-appointed roads the urinal and the vessel of the commode, as well as their conducting-pipes, are made of a glazed earthenware, which admits of thorough washing; but many coaches are daily occupied by the public in which the material used is zinc, tin, or iron, and the least possible attention is paid to their cleanliness.

The reservoir of drinking-water is securely fastened to the partition-wall between the *salon* and the coach. A silver-mounted spigot in the general interior of the car compensates the traveler for the polluted source from which the water flows; and unless he has been thoughtful enough to provide his own drinking-cup he must use the mug of tin or pewter, that atom of "civil rights" which, polluted by the contact of many lips, is unmolested in its dirt.

What rational man would place the water-cooler which contains the drinking-water of his family in the water-closet or privy of his establishment? and yet we find upon nearly all the lines of travel this violation of hygienic law.

While the foregoing is strictly true in regard to the majority of railway coaches in the South and West, some notable instances of improvement are found. The coaches upon the roads controlled by the Pennsylvania Company are provided with a cylindrical water-cooler, which projects above the roof of the coach. In no way can the fluid contents of this reservoir become polluted by the atmosphere of the car. The Louisville & Nashville Railroad Company and some few others provide large water-coolers, which are placed at the unoccu-

pieced ends of the cars; a great improvement upon the method first mentioned, but still inferior to that of the Pennsylvania Company.

Upon the coaches of the Pullman Sleeping-car Company the objection noted of inclosing the urinal, commode, and reservoir of drinking-water in the *salon* exists; but the dangers which arise from this fault of construction are doubled, from the fact that two *salons* are provided, one for each sex, and the equipment of the *salons*, so far as the reservoir is concerned, is identical.

Upon a railway train thus equipped the task of proving an active agency in the diffusion as well as transportation of disease is far from difficult.

It is almost universally acknowledged that the excreta of persons suffering from contagious or infectious diseases are active agents in its dissemination; that this diffusion may occur from actual contact with the excreta, or from the inhalation of atmosphere impregnated with their products, or from the imbibition or deglutition of fluids or other substances infected with the same. We will suppose an individual from a point infected with cholera enters a coach upon a railway. He may be at the time suffering with the premonitory diarrhea, or he may be seized with the same after the departure of the train. The commode of the *salon* is called into active use, and whenever the desire is present with the egotism of the American traveler the contents of the rectum are discharged. It is true that upon roads ballasted with sand a partial disinfection occurs, and also that many of these dejections take place in isolated positions where no one can be injured; but it is also true that the lines of railroads frequently pass in close proximity to dwellings and other habitations, and that very often the bed of the railroad is at a considerable elevation above the buildings. It has frequently been observed by the writer that the excreta from the *salon* of a railway coach could without doubt fall in close

proximity to the wells, drains, and out-houses of dwellings along the roads traversed. In a large inland city the initial case of cholera in the epidemic of 1873 occurred in a small house so located that any substance dropped from passing railroad trains would inevitably fall close to the rear door of the dwelling. Cholera existing upon the line of a railway or at either termini, it is quite as rational to account for the sudden and mysterious development of the disease by such cause as to suppose that an endemic agency has especially been established.

The fetid atmosphere of the *salons* of many coaches is a matter of daily comment among those who are obliged to travel much during the heated term; and if any one doubts the effect of the noxious gases of these rooms upon the drinking-water stored up in them, a small quantity of the permanganate of potash will demonstrate the condition of the water after remaining a night in the reservoir.

Americans demand that transit should be not only rapid but luxurious. This demand is fully met by the Pullman Car Company, whose coaches are attached to nearly all railway trains. These coaches are divided during the night into "sections," which are separated from each other by wooden partitions, and from the remainder of the coach by thick woolen curtains. Equipped for a night's travel, each section forms two beds; the lower composed of the covered seats, a mattress covered with some woolen fabric, two sheets, two pillows (generally in woolen cases, which for use are covered with linen), and one or more heavy blankets. The upper bunk is the counterpart of the lower, save that the framework of the bed is not covered with the same class of material, and during the day is not exposed to contact with the persons of those who may be diseased.

Double glass sash protect each window, and heavy woolen curtains are further provided to protect the traveler from air, sun, and dust. The ventilation of these coaches is a matter

of much care upon the part of those having them in charge, but the total air-space of an unequipped car is but 10,080 cubic feet; and allowing but two persons to each section, exclusive of the conductor and his porter, there would be *per capita* a vital air-space of 504 cubic feet. The vital capacity of the coach is, however, materially reduced by the *salons* and by the heavy furniture, which certainly occupy fully one tenth of the air-space. In many of these coaches an apartment is partitioned off for the more luxurious or exclusive of travelers, differing in no way but its isolation from the remainder of the car.

To the credit of the company owning these coaches it must be said that every care is taken to keep all appliances in the most perfect order as regards cleanliness. The coach is ventilated as well and as often as circumstances will admit. The furniture is cleaned frequently during each trip, and the entire coach is stripped and cleaned after each journey. The bed-linen is supposed to be used but once. The mattresses and pillows are aired and beaten. Indeed so many and so great are the precautions adopted to secure cleanliness that at the first glance it would seem unjust and unnecessary to suggest further precautions. But the duty imposed upon sanitarians is imperative, and it is held that by additional precautions the rapid dissemination of contagious diseases will be diminished.

To sleeping-coaches over the ordinary railroad coach must be accorded the palm in the ability to spread disease. In proof of this assertion it is but necessary to ask that the reader recall his individual experience while upon any journey. Within two years small-pox has been epidemic in many American cities. We will suppose a female visiting at an infected point to be stricken with the disease. The patient demands of her friends removal to her home. How difficult it is to a loving heart to resist such appeals! How difficult it is to determine in such a case that sanitary requirements

shall be observed! What is to prevent the securing a state room of a sleeping-car, and what is to prevent the closely-veiled patient from performing her journey undetected? The conductor of a sleeping-coach is not by law a detective; he has no right to demand the removal of the veil. We may sympathize deeply with the unfortunate female who is seized with this loathsome disease, but we sympathize still more deeply with the human who in the next few hours occupies the same bed.

What is to prevent a syphilitic, with infected mouth or throat, from drinking out of the same glass that the majority of the other occupants of the car are obliged to use? Instances might be multiplied of travelers with all manner of diseases striving to reach their homes, and forced to obtrude themselves upon common carriers. Occasional cases of cholera and yellow fever, frequent cases of acute and chronic diarrhea, children in all stages of cholera infantum, any or all of the fevers or the exanthemata may be found. What is to prevent them? Occasionally an unfortunate female is taken with the pains of labor; and death—not sudden and violent death, but death resulting from the ravages of disease—too frequently rides upon the cars.

It is suggested that the remedies for the evils which have been pointed out are of a ready application. The diagram illustrates the present faulty construction of too many carsalons. These evils may be remedied in detail: by removing the reservoir of drinking-water to the unoccupied end of the car; by constructing the entire vessels of urinal and commode so that they may be absolutely cleansed with water at stated intervals. Soap or some other disinfectant should be always present in the urinal; and below each commode should be arranged a bucket, of sheet-iron or some other material, containing a strong solution of copperas, and which should be emptied into a protected cess-pool at stated intervals by an attendant detailed for that purpose.

It is suggested that the Pullman Car Company provide at the termini of all lines upon which their coaches are placed a hot-air closet, similar to that recommended by Ransom, in which all mattresses, pillows, and blankets may be placed, and therein subjected for a time to a temperature of 250° F. after each trip of the coach to which they belong.

It is impossible to prevent the access of infected persons to the interior of railway cars; it is utterly out of the power of the conductors or other attendants to detect and exclude those who may be diseased; therefore the greater necessity exists for the exercise of the greatest prudence. It is suggested that the supply of bed-linen be sufficient in each car; that under no circumstances shall the same articles be used more *than once*; that each car be provided with a supply of permanganate of potash; and that the conductor be instructed at stated intervals to wash out the drinking and washing utensils with a proper solution of this salt, and to pour also a quantity of the same solution through the urinal and commode.

The use of the heavy woolen curtains should be abandoned, and the sections should be arranged as lounges rather than as beds. The thick curtains delude into a sense of seclusion, which leads to injurious disrobing at night upon railway trains, and the surface of delicate and susceptible bodies comes too often in contact with fabrics upon which loathsome diseases have rested.

Upon the roads controlled by the Pennsylvania Company there is now in process of construction an especial car for emigrants, in which, while comfort is secured, there will be no fixtures which will prevent the coach being washed out at any and all times by a full stream of water; and in this way not only filth will be removed, but the car will be kept from much which results from the presence of disease. The construction of such coaches may well be followed by other lines.

LEBANON, KY.

